

Preface

The aim of this book is to provide texts about water-related issues arising through biofuel production, especially in response to climate changes. Major focus is on sustainable availability of clean water. It demonstrates the associations among biofuel, water and climate changes especially focusing on interdisciplinary connections that outstandingly update and enhanced understanding, deliberation and responsiveness across such disciplines.

To entice readers from different disciplines, the book offers broad perspectives on diverse aspects of climate changes impacts on water availability for present and future biofuel production. All the chapters are in-depth to highlight the relevant aspects. Major types of biofuel have been discussed to provide comprehensive compilation of relevant practical information on several aspects of biofuel, water and climate changes. The present book serves as a useful quick reference for every person involved in biofuel production or having interest in water issue and climate changes. Advanced students, researchers, instructors, decision-makers and professionals in the biofuel, water and climatic changes field will use it as a good introductory resource.

Biofuel including bioethanol, biogas and biodiesel are most promising eco-friendly substitutes to petroleum derived fuels, which are generated from renewable sources. Chapter 1 of the book illustrates biofuel, its types, applications and their feedstock resources. Further, rise of global water demand for the production of biofuel and serious outweighs greenhouse gases reduction impact of biofuels have been discussed. Chapter 2 contributes to an enhanced understanding of present climatic conditions, observed climate trends and climate vulnerability to water availability. Biofuel production processes use freshwater for different activities which becomes contaminated with organic and inorganic pollutants. Chapter 3 describes agricultural and industrial activities involving current water consumption during biofuel production. Groundwater is strategically significant due to its exceeding demand in agriculture, domestic and industrial uses. Chapter 4 keeps discussion on wastewater generation from biofuel production and how the groundwater quality is being deteriorated. In Chap 5, biofuel's effects on human health have been discussed. The water–biofuel relationship is being recognized as

backbone of the factors fundamental for the future sustainable supply of biofuels. The last chapter presents prospective and future trends of the water–biofuels relationship in reference to biofuel production technologies, also the obligation of reusing wastewater and application of undiluted wastewater to grow feedstocks for biofuels to save freshwater resources.

Quick decisions must be taken now, on the use of water resources for biofuel production keeping in mind the climate change scenario to reduce the risks of future droughts and unavailability of freshwater. Less water-intensive feedstock will have to exploit if we have to avoid high-end pathways of emissions which could result in global average temperature increase. It implies that future development will increasingly need to be fuelled by less water consuming biofuel sources accompanied by much more efficient use of resources to enable development within environmental limits.

Overall, the book covers a wide range of scientific and technical aspects of water-related issues of biofuels in climate change scenario. The text is of interest to students, researchers, academicians and industrialists in the areas of water, environment, biofuel production and climate changes.

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Perspectives on Water Usage for Biofuels Production
Aquatic Contamination and Climate Change

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2018, XIII, 121 p. 14 illus., 2 illus. in color., Hardcover

ISBN: 978-3-319-66407-1